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most important results. The speaker then showed graphic charts illustrating the family histories of a number of families. These charts showed the strong inheritance of feeble-mindedness and also illustrated the points made in regard to alcohol and sexuality. Considerable discussion followed.

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REVIEWS AND ABSTRACTS OF LITERATURE

Einleitung in die Philosophie. HANS CORNELIUS. Zweite Auflage. Leipzig und Berlin: Druck und Verlag von B. G. Teubner. 1911. Pp. xv + 376.

The philosophic individuality of Cornelius is the synthesis of two apparently antagonistic modes of thought: it has been molded by the same tendencies that shaped the anti-metaphysical methodology of Mach; but—as Cornelius rightly insists (pp. 211, 343)—it bears not less clearly the stamp of Kant's transcendental logic. By regarding the *Einleitung* from this point of view—as an independent philosophic complement of Mach's positivism—we shall probably best succeed in fixing its place in contemporaneous literature.

Perhaps no living thinker has proved so baffling to professional philosophers as Ernst Mach; perhaps no one has to such extent evoked what I should call "the metaphysician's fallacy." For Mach's method of procedure is the method of the natural scientist: he investigates his problems, one by one, according to the peculiar conditions of the case, without regard to whether his conclusions fit into a preconceived system. It is but necessary for the critic to assume that such a system exists and nothing is easier than to prove inconsistencies. What Mach attempts, however, is not a system of philosophy, but a methodology. Those critics have never comprehended the trend of Mach's thinking who attach an exaggerated, quasi-metaphysical meaning to his "sensations" or "elements." For Mach, his elements are not absolute, but provisional units. Nor does he suppose for a moment, as even so friendly a critic as Dr. Carus assumes, that the elements are immediate data of consciousness.¹ The cardinal point lies in the definition of scientific endeavor as a progressive determination of the functional relations of the elements. For this definition at once eliminates as utterly idle all such concepts of popular philosophy as the *ego*, the *Ding an sich*, or the principle of causality, and thus constitutes the core of Mach's anti-metaphysical positivism.

This methodological standpoint alone does not, of course, account for the origin of these popular concepts and Mach himself has indicated that it is obligatory to investigate *what* functional relations of the immediate data necessitated these methodologically no longer valuable concepts.²

¹ "Erkenntnis und Irrtum," 1906, pages 12, 16.

² *Loc. cit.*, page 13.

This genetic inquiry, it must be admitted, Mach has rather suggested than undertaken in detail from a uniform psychological point of view. But in still another direction it was possible to supplement Mach's investigations. Mach rightly repels the criticism that his psychology ignores the spontaneous activity of the human mind; indeed, his emphasis of the principle of the economy of thought suffices to refute the accusation. Nevertheless, the formal peculiarities of Mach's presentation lend some color to the charge, and his definitions of consciousness might be misinterpreted by prejudiced critics as a relapse into atomistic and passivistic psychologizing.

No such misinterpretation would be possible in the case of Cornelius. In the center of his philosophy stands Mach's principle of the economy of thought, which is, however, at once recognized as but another expression of the unity of consciousness. This principle explains at the same time the efforts of prescientific thought, the historical attempts at metaphysical unification, and the scientific striving for a view of the universe. The weakness of primitive and of metaphysical speculation lies in the fact that both make uncritical employment of traditional, popular ("naturalistic") concepts. The investigation of the legitimacy of these concepts, that is, of their origin and empirical meaning—such as the concepts of the persistent external world, of the reality of space and time, of causality, and of the ego—coincides with the coming of age of philosophy, its transition from dogmatism into empiricism, from the metaphysical into the epistemological stage. The naturalistic concepts lead to problems insoluble, not from any deficiency of the human intellect, but because of the erroneous assumptions involved in their formulation (*Scheinprobleme*). These stumbling-blocks can be removed only by a general inquiry into the mechanism of thought, by a natural history of human thought. Such an investigation will not aim at a purely destructive annihilation of the popular view of the world, but at a genetic understanding of that view and its clarification through the elimination of dogmatic elements. It must indeed be idealistic in the sense that it will proceed from the data of consciousness, which alone furnish the material for the structure and the totality of factors for the development of our world-view. Instead of denying, however, the existence of an objective world, it will merely attempt to show from what facts this concept is derived and thus determine its purely empirical significance. Cornelius's epistemology is thus emphatically psychologistic, not in the sense of resting on special *theories* of psychic phenomena, but in the sense in which all epistemology, tacitly or explicitly, must be psychologistic—in being based on an unprejudiced analysis and description of the immediate *facts* of consciousness (pp. 55 f.). And here what at once distinguishes Cornelius's psychology from an atomistic view is his emphatic and never-ceasing consideration of "*die Factoren des Zusammenhangs der Erfahrung*"—those factors which Höffding has conveniently included under the concept of the formal unity of consciousness.³

Cornelius begins his inquiry with a consideration of the psychological

³"Psychologie in Umrissen," page 186.

theories developed by the English thinkers of the seventeenth and eighteenth centuries. This naturally leads to a critique which merely expresses the general consensus of modern psychologists as to the failure of the association theory to account for the distinctively synthetic peculiarity of consciousness (pp. 196 ff.). It is the faulty psychology of the associationist school that resulted in the skeptical conclusions of their philosophy; for a theory which from the start limits our knowledge to isolated, momentary perceptions, impressions, and ideas, can not arrive at a positive theory of generally valid knowledge (p. 208).

The way to correct Hume's philosophy, therefore, is to correct the faults of his psychology. What we actually find in consciousness is not a mere sum of unrelated impressions and ideas out of which our experience shapes itself by virtue of the laws of association, but a unified whole. The point is to ascertain those facts which may be noted in any period of consciousness over and above the isolated elements of experience. The first synthetic factor described by Cornelius produces the recognition of a definite part of the stream of consciousness as marked off from its surroundings. A second factor connecting the otherwise isolated elements of experience is the symbolic function of memory images. By means of this function we transcend the limitations of the present moment and form an idea of a past experience *as* a past experience. A third factor enables us to classify every new sensation and complex of sensations, to recognize it as similar to previous experiences or complexes of experiences. These synthetic factors correspond to Kant's synthesis of "intuitive apprehension," "ideational reproduction," and "conceptual recognition," and in Kant's deduction of the categories of the understanding from the unity of consciousness Cornelius recognizes the historically first attempt in his own direction (p. 228).

Without the facts conditioned by the synthetic factors, a unified experience would be impossible. They determine the most general laws of conscious phenomena—among them the recollection and recognition of complexes. All our experiences are parts of complexes, and are remembered as parts of complexes. The law of association by contiguity is a special instance of the general law that every experience (*Erlebnis*) is merely part of a larger complex (p. 234). Similarly, the law of association by similarity is merely an expression of the same principle: we do not merely recollect a past experience similar to a present one, but also distinguish it as past by recalling at the same time the associated elements of the past complex. Both laws are not, as might be supposed on the basis of the old associationist school, alien forces regulating the course of conscious states, but laws immanent in all consciousness—consequences of those factors without which even the simplest case of unified consciousness would be inconceivable (pp. 207, 236 f.). Cornelius's account of these laws thus recalls that of Höffding, who similarly views association as but a special form of synthesis.⁴

Having enumerated the synthetic factors and their consequences,

⁴ *Loc. cit.*, page 219.

Cornelius turns to the problem of the development of our concepts and judgments through these factors. In the assimilation of any new experience, we proceed in one of two ways. We either confine ourselves to classifying it as similar with certain previous experiences; or, we step beyond the mere classification of our experience and infer that it forms part of a complex of other experiences. The concepts formed in these ways Cornelius describes as falling into two distinct categories: perceptual concepts (*Wahrnehmungsbegriffe*) and experiential concepts (*Erfahrungsbegriffe*). To subsume a given portion of my visual field under the perceptual concept "whiteness" is one thing; to infer, beyond the immediate data, that whiteness represents "white chalk" constitutes the quite different step of subsuming under an experiential concept. The second process always takes place when we refer an impression to a persistent object.

For the explanation of the development of our knowledge Cornelius introduces the concept of "configuration," *Gestaltqualität*. By this he understands those characteristics which define a complex as a complex, that is, as different from a mere summation of its elements. The significance of this concept results from the fact that all the contents of our consciousness are parts of complexes and as such possess relation—fringes due to the configuration of their complexes. Among the concepts of complex-characteristics there are some relating to the modes of connection of our experiences in so far as these modes have their foundation in the unity of consciousness. As every one of our experiences must be connected with other experiences in these particular ways, these "relation-concepts" are applicable to all experience, and the judgments based on them are necessarily valid for all possible experience, regardless of the nature of the contents of the experiences. Borrowing Kant's term, Cornelius accordingly refers to these concepts as general modes of intuition. From these he eliminates Kant's spatial mode, first, because haptic and optic space are not immediately connected as parts of the same space and are not three-dimensional; secondly, because even in the field of sensation, sounds are arranged without spatial order, while the same applies to the relations of sensations to memory images, or of sensations, judgments, and feelings (pp. 252 f.). On the other hand, Cornelius includes among his modes of intuition not only time, but also the concepts of totality and partiality, unity and plurality, similarity and equality, constancy and mutability, as well as the direction of the changes.

This grouping suggests Ebbinghaus's treatment of the same intuitions as "the general attributes of sensations." Cornelius's discussion of this subject is probably the least satisfactory portion of his work. There is no serious attempt to justify the coordination of the other modes of intuition with that of time. It is perfectly true, for example, that the concept of similarity is applied to every possible experience in the sense that every experience is classified with reference to its resemblance to previous experiences—that the apprehension of similarity may be described as merely an expression of the unity of consciousness. But this immediate classi-

fication does not involve the construction of a continuum in which "*alles Mannigfaltige der Erscheinungen in gewissen Verhältnissen angeschauet wird.*" While time is, in Höfding's phrase, a typical individual idea, all the several times experienced being but parts of the same time, this does not apply at all to similarity. In a previous section (p. 245) Cornelius himself very clearly distinguishes between similarity as an immediate datum of consciousness and the abstract concept of similarity. The abstract concept of similarity naturally comprises as a concept all possible special cases of similarity; but of course it is not present in all conscious phenomena. The apprehension of similarity, on the other hand, is indeed coextensive with consciousness, but each such apprehension is distinct from every other, and consequently it is not justifiable to speak of similarity as a general mode of intuition. So far as the exclusion of space from the universal modes of intuition is concerned, Cornelius's reasons—quite irrespective of the justice of his conclusions—can not be considered satisfactory. In limiting psychological space to two dimensions, the author certainly finds himself in excellent company, but an indication that other views are held would have been in place in a treatment which allegedly rests on the facts rather than the special theories of psychology. The same criticism applies to the denial of spatial quality to sensations of tone. If a psychologist like Wundt insists that we can not hear tones without localization,⁵ such opinions can not be disregarded without some critical discussion. It would have been better and fairer to explain on what psychological assumptions space could not be regarded as a universal mode, and under what assumptions it *must* be regarded in this light.

Having disposed of the purely classificatory perceptual concepts, Cornelius turns to the second category of experiential concepts. We continually complement the given perceptions by referring them to constant objects, that is, by associating them with characteristics not immediately given to us, which is equivalent to associating them with possible *future* experiences. It is the synthetic character of consciousness that leads us to view every experience as a member of a complex. Our expectations as to the experiences linked with a given experience are defined in some measure by the knowledge that it has hitherto appeared only in a certain definite series. If an initial member common to several known series is linked with final members varying with intermediate members, the latter are recognized as *conditions* of the final links and determine the nature of our expectations. The complementary activity which forms experiential concepts and explains isolated phenomena by connecting them with others is nothing but a *résumé* of our past experience and the expectation of future events in accordance with the past. The shorthand description of experience synonymous with the application of the principle of economy of thought is also identical with the formation of experiential concepts (p. 263). As the concept of a constant object implies nothing but the sum-total of its constant properties, what applies to the latter also applies

⁵ "*Ohne irgendeine Lokalisation können wir auch Töne nicht hören.*" In "*Was soll uns Kant nicht sein?*" *Kleine Schriften*, 1910, I., page 160.

to the former: it expresses nothing but a series of definitely connected phenomena. To attribute reality to an object regardless of our perception of it simply means, as Hume failed to notice, that we connect our *varying* percepts with the *same* context of other percepts of the object. Kant correctly explained the belief in the reality of objects, but failed to note that in so doing he had already explained that constant which an earlier philosophy postulated as an unknowable noumenon. By supposing that objects, as complexes of phenomena, must be phenomena of something else—of an ever transcendent *Ding an sich*—Kant relapsed into naturalistic philosophy (p. 277). The opposition thus engendered between noumena and phenomena is quite illusory. The foregoing considerations immediately eliminate two supposed problems which have disturbed the philosophers of many ages as to the connection between subject and object (*"Vermittlungsprobleme"*). As the concept of reality is constructed solely out of our subjective data, the problem how we can recognize the objective world despite the subjective conditions of our knowledge disappears, because it is seen to invert the actual conditions of the case. On the other hand, there also disappears the impassable barrier between the physical and the psychical world which is inevitably encountered on the dogmatic assumption of objective reality. As Cornelius puts it: *"zu fragen, wie es komme, dass das Ding durch die Sinnesorgane auf unser Bewusstsein wirke, heisst also soviel als fragen, wie es komme, dass der gesetzmässige Zusammenhang unserer Sinneswahrnehmungen, welchen wir erfahrungsmässig erkannt und in bestimmter Weise bezeichnet haben, wirklich eben dieser Zusammenhang unserer Wahrnehmungen ist"* (p. 280).

Cornelius fully recognizes that his investigation of the mechanism of concept-formation is purely psychological. Accordingly he now turns to the logical question of the validity of our concepts and judgments. After briefly sketching the psychology of the confirmation or repudiation of specific judgments, he arrives at the conclusion that judgments are of general validity only if the conditions defined in their formulation themselves determine quite generally the nature of the experiences to be observed under those conditions. This is true of analytical judgments; and also of the synthetic judgments resting on Cornelius's first category of concepts (*Wahrnehmungsbegriffe*), for the "knowledge of acquaintance" with any phenomenon that can be subsumed under a perceptual concept completely exhausts the possibilities of such a phenomenon. That spectral green resembles blue more closely than red is not an analytic judgment, because it does not follow from the definition of "green"; nevertheless it is a statement of universal validity. This is not true of the experiential judgments, of our "laws of nature," for the observation of innumerable past experiences does not seem to establish the validity of a prophecy as to future experiences of a similar character. Observations contrary to past experience disturb our mental equilibrium, which can be readjusted only by bringing both the ordinary observation and the deviations from it under a common law. This is done by correlating the usual experience with a formerly unnoticed condition, a change in which results in a dif-

ferent experience; in such cases we speak of the *cause* of the changed result. The principle of causality thus embodies merely the demand—indispensable for the unity of our experience—that all phenomena shall be arranged in constant empirical combinations. Accordingly, this principle has absolute validity and likewise defines the validity of our experiential laws: they are valid in so far as a hitherto unobserved cause does not produce an alteration. The category of causality is thus founded in the synthetic factors of consciousness (pp. 297–307).

There remains to be explained the naturalistic concept of the ego. As we distinguish from the varying perceptions of an object the *persistent* object of the external world, so we develop the concept of a permanent ego as opposed to the flux of conscious phenomena. As in the former case, Cornelius identifies the concept of a persistent reality with the formation of concepts of his second category. Any single state of consciousness is found in a definite connection with past states of consciousness, not immediately experienced, but in some measure determining it. These definite connections constitute the constant factors of our personality and may be described as “unconscious psychic facts,” provided this phrase is taken merely as an abbreviated designation for definite, regular combinations of conscious phenomena, just as the concept of an objective thing is used merely to denote a definite connection of phenomena (pp. 314 f.).

The subject of the ego naturally leads the author to consider two related problems—the relation of mind and body and the knowledge of alien consciousness. On both these questions Cornelius develops views of extraordinary sanity. The solipsistic view can not be refuted, because the direct experience of alien conscious states is forever precluded. On the other hand, the association of certain outward manifestations with consciousness is in consonance with the scientific, as well as prescientific, application of the principle of the economy of thought. Further, it is not a metaphysical association, because the concept of alien consciousness, being patterned on our own, does not transcend experience (pp. 329–332). With regard to the relation of mind and body, Cornelius admits psychophysical parallelism for sensations; “*weil die physischen Vorgänge ihrem Begriffe nach nichts Anderes sind, als die gesetzmässigen Zusammenhänge, denen wir unsere Empfindungen einordnen*” (p. 319). But it is not true that the parallelism of ideation and of physiological processes is an empirical fact. An analysis of the psychophysiology of the reflex arc leads to the result that while central nervous paths are intermediaries of sensation and movement, there is nothing to prove that they correspond to the psychological act of association following the sensation. Pathological cases are likewise inadequate to prove the point. So far as brain disease is not definitely observed, the assumption that a psychic derangement is necessarily due to a cerebral anomaly is a pure dogma. But, even when an affection of the brain is definitely ascertained, it might be supposed that the disease conditions an alteration of the *sensation* rather than of the relevant associations. Which of these views represents the facts can not be determined, and accordingly the general question whether psycho-

physical parallelism holds for psychic facts beyond sensations and feelings remains unsolved. That the course of ideation depends on sensations and is thus indirectly conditioned by physiological processes, is readily admitted (pp. 326-328). The constant factors of psychic life are by definition independent of physiological alterations. This does not mean that the course of ideation is similarly independent, for those constant factors are precisely what the stream of ideas (*Vorstellungsablauf*) does not consist in. Accordingly, Cornelius infers from the independence of the constant factors that psychic life does not necessarily disappear with its physiological substratum. Inasmuch, on the other hand, as the constant factors are not themselves conscious experiences, but only conditions of such, it is equally inadmissible to infer the persistence of psychic life after death from the constancy of those factors. This argument is not particularly cogent. The constant factors are conditions, but they are not fully determining conditions, of consciousness. Psychic life involves a stream of ideas admittedly dependent—though only indirectly—on physiological conditions. The cessation of these conditions, it would seem, must necessarily result in a cessation of conscious phenomena. Indeed, if the constant “unconscious” factors are nothing but our experiences as to definite combinations of conscious phenomena, if consciousness is unthinkable without feelings, and the latter are admittedly dependent on physical conditions (p. 319), it is not at all clear how consciousness could survive death.

The “empiricist picture of the universe” sketched by Cornelius towards the close of his book (pp. 332-348) has already been sufficiently indicated in the preceding pages. The recognition of all our laws as merely abbreviated expressions for our experiences eliminates all the illusory problems based on the uncritical assumption of the naturalistic concepts. Thus, Kant’s first antinomy is now found to rest on the naturalistic concept of the universe as an immediate datum of knowledge. If we conceive the world merely as a résumé of our experiences, its existence can not extend beyond the ordering of our experiences in accordance with the categories of our thinking, and instead of regarding it as infinite, we can state only that our increasing experience is nowhere hemmed in by any limits. This position eliminates the possibility of satisfying the metaphysical demand for a unification of the entire universe, for our intellectual machinery, the categories, are by virtue of their significance applicable only to the fractional components of our experience, not to a complete “unit” beyond experience. There is only one case in which we have scientific knowledge transcending a determination of parts—the knowledge of the fundamental unity of our consciousness which differs from all our fractional experiences in appearing not as a manifold, but as an immediately unified reality.

In the opening paragraphs of this article the philosophical position of Cornelius has already been indicated. The foregoing summary, it is to be hoped, has convinced the reader that we here have to deal with a solid attempt to grapple with philosophic concepts. Cornelius’s attempt is not a

final solution of the philosophical problem from a positivistic standpoint, because that very standpoint precludes a final solution. For positivism demands a philosophy that shall deal with particular philosophic concepts and problems, as every science deals with *its* problems. No sane scientist denies that each of his problems admits of indefinitely more profound investigation, and in precisely the degree in which philosophers will attack their specific problems in the same spirit they will rehabilitate their scientific standing. With regard to Cornelius it has been indicated that several of his analyses do not seem to attain to the relative degree of profundity that might have been expected. But viewed as a whole, and more particularly as contrasted both with the reactionary sciolism now invading philosophical literature and with the crudities of much *soi-disant* positivism, his epistemology constitutes a landmark in the transition to a philosophy of the future that will be at once uncompromisingly radical and unassailably critical.

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Experiments in Educational Psychology. DANIEL STARCH. New York: The Macmillan Company. 1911. Pp. vii + 183.

Two questions arise in the consideration of this work. First, what is its value in relation to other books in the same field? Second, what is the value of this method of approach to the problems of education: does it bring new insight or does it complicate the situation?

Dr. Starch has brought together some valuable materials which must prove very stimulating to the teachers who are able to grasp them. He gives experimental methods for testing in concrete ways the facts of individual differences, the obstacles to learning which result from defective sensation channels, the place of mental imagery in the processes of learning and knowledge, the place of "trial and error" in experience, the progress of habit-building, the actualities in "formal discipline," the facts of "association," the nature of the apperceptive processes, the methods and laws of attention, the values of memory in learning, and the vital relationships of work and fatigue. All these things are real factors in the equipment of the teacher, and the teacher can not know too much about them. Any work which attempts to make clear these fundamental elements in mental development must be welcomed, and it must be said that Dr. Starch has organized his materials in such a way as to make them very interesting to the teacher of educational psychology, and, rightly interpreted, to the average teacher.

But there is another side to the matter, as indicated by the second question. Experimental education has been going its own way in the last few years, and a rather curious way it is, too. Education, as a whole process, is becoming more socially minded; we are being told that it is essentially a social movement, growing out of social pressures and leading into social programs, both for the child and the race. From this point of view "only social psychology is of primary importance for education." On the other hand, experimental education seeks to isolate certain mental